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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant(s): Clark Woody et al.

Serial No.: 09/614,898

Filed: July 12, 2000

For: Apparatus for and Method of Severing and Sealing Thermoplastic Film

Group Art Unit: 3721

Examiner: Gloria R. Weeks

Docket No.: J-2850

Customer No.: 29471

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April 28, 2005

Thomas. R. Stiebel
Reg. No. 48,682
Attorney for Applicant(s)

RESPONSE TO NOTICE OF NON-COMPLIANT APPEAL BRIEF

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith is Appellants' Amended Appeal Brief in response to the "Notification of Non-Compliant Appeal Brief" dated April 12, 2005, with respect to the Appeal taken to the Board of Patent Appeals and Interferences in the above-identified application.

Respectfully submitted,

McCracken & Frank LLP
200 West Adams, Suite 2150
Chicago, Illinois 60606
(312) 263-4700

April 28, 2005
Customer No. 29471

By:

Thomas R. Stiebel
Reg. No. 48,682

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant(s): Clark Woody et al.	**Certificate of Mailing**
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For: Apparatus for and Method of Severing and Sealing Thermoplastic Film	April 27, 2005
Group Art Unit: 3721	
Examiner: Gloria R. Weeks	Thomas. R. Stiebel Reg. No. 48,682 Attorney for Applicant(s)
Docket No.: J-2850	
Customer No.: 29471	

APPEAL BRIEF

Mail Stop Appeal Brief-Patent
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This amended appeal brief is being provided in response to a "Notice of Non-Compliant Appeal Brief" dated April 12, 2005. Applicants contend the present appeal brief is now fully responsive to the April 12, 2005 communication and the Final Rejection dated November 4, 2004.

(1) Real party in interest

This appeal is made on behalf of S. C. Johnson & Son, Inc., located at 1525 Howe Street, Racine, Wisconsin 53403-5011.

(2) Related appeals and interferences

At present, there are no other appeals or interferences known to appellant, the appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision on the pending appeal.

(3) Status of claims

Claims 1-4, 7, 8, 11, 12, 15-18, 22-24, 26-30, and 34-39 stand rejected and are presently being appealed. Claims 5, 6, 9, 10, 13, 14, 19-21, 25, 31-33, and 40 have been cancelled by a previous amendment.

(4) Status of amendments

No amendments have been filed subsequent to the final rejection.

(5) Summary of claimed subject matter

Claim 1 specifies a method of severing and sealing a plurality of layers of film 108 formed of a thermoplastic material (page 5, lines 2-6). The method includes the step of heating a cutting edge implement to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of the film 108. The temperature is sufficient to melt but not to burn a thermoplastic material (page 7, lines 22-31). The method further includes the steps of feeding the plurality of layers of the film 108 between the heated cutting edge implement and an opposing surface and moving the heated cutting edge implement and the opposing surface relative to one another to pinch the plurality of layers of film 108 therebetween (page 11, lines 25-31). Thereafter, relative lateral movement between the heated cutting edge implement, the plurality of layers of the film 108, and the opposing surface is suspended, while the heated cutting edge implement and the opposing surface are relatively biased together with the plurality of layers of film 108 pinched therebetween, until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film 108 by melting but not burning the plurality of layers, contacts the opposing surface, and seals the plurality of layers of the film 108 together (page 6, line 30 – page 7, line 4 and page 11, line 31 – page 12, line 10).

Claim 8 recites a method of severing and sealing a plurality of layers of film 108 (page 5, lines 2-6). The method includes the step of heating a cutting edge implement to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of the film 108. The temperature is sufficient to melt but not to burn a film (page 7, lines 22-31). The method further includes the steps of feeding the plurality of layers of the film 108 between the heated cutting edge implement and an opposing surface and moving the heated cutting edge implement and the opposing surface relative to one another to pinch the plurality of layers of the film 108 therebetween (page 11, lines 25-31). The method also includes the step of relatively biasing the heated cutting edge implement and the opposing surface together with the plurality of layers of film 108 pinched therebetween, until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film 108 by melting but not burning the plurality of layers and seals the resulting severed edges. (page 11, line 31 – page 12, line 10).

Claim 15 is directed toward an apparatus 100 for severing and sealing a plurality of layers of film 108 formed of a thermoplastic material (page 5, lines 2-6). The apparatus 100 includes a cutting edge implement that is a hot wire 110 and a controller for regulating the temperature of the cutting edge implement (page 7, lines 16-21 and page 12, lines 7-10). The cutting edge implement is heated to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of film 108, the temperature being sufficient to melt but not to burn a thermoplastic material (page 7, lines 22-31 and page 12, lines 4-10). The apparatus 100 also includes an anvil 134 and means for feeding the plurality of layers of the film 108 between the heated cutting edge implement and the anvil 134 (page 6, lines 18-22). Means are also provided for moving the heated cutting edge implement and the anvil 134 relative to one another to pinch the plurality of layers of film 108 therebetween (page 6, lines 3-22; page 10, lines 7-13; and page 11, lines 25-28). The apparatus 100 also includes means for suspending any relative lateral movement between the heated cutting edge implement, the film 108, and the anvil 134, while pressing the heated cutting edge implement toward the anvil 134 with the film 108 pinched therebetween (page 9, lines 15-28 and page 11, line 28 – page 12, line 4). The film 108 is pinched between the cutting edge implement and the anvil 134 until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film 108 by melting but not burning the

plurality of layers, contacts the anvil 134, and seals the plurality of layers of the film 108 together (page 7, lines 1-4 and page 12, lines 4-10).

The means for moving the heated cutting edge implement and the anvil and the means for suspending any relative lateral movement between the heated cutting edge implement, the film 108, and the anvil 134, as specified by claim 15, comprise a rotating seal drum 102 and a cam shaped track assembly. The seal drum 102 includes a plurality of cutting assemblies 114, wherein each cutting assembly 114 has a cutting edge implement in the form of a hot wire 110. The cam shaped track assembly includes a pair of opposing anvil cam tracks having a plurality of anvil assemblies 106 mounted thereon at spaced intervals, wherein each of the anvil assemblies 106 includes a pair of spring loaded anvils 134. The film 108 is fed into the apparatus 100 between the rotating seal drum 102 and the counter-rotating anvils 134 by any known means, such as feed rollers. The seal drum 102 and anvil assemblies 106 may be commonly or separately driven by a known motor and gear train or any other known mechanism so that the anvil assemblies 106 move around the cam track assembly 104 at approximately the peripheral speed of the rotating seal drum 102. One of the anvils 134 contacts the film 108 and clamps it firmly against the seal drum 102. The hot wire 110 of the opposing cutting assembly 114 advances through an opening 112 in the seal drum 102 and contacts the film 108, pressing same against the anvil 134. The cutting assemblies 114 are reciprocated radially inwardly and outwardly by way of cam followers 130 moving along cam tracks 132. The cam tracks 132 are designed so that the hot wire 110 of the cutting assembly 114 extends through the opening 112 in the seal drum 102 for approximately one-third of each revolution of same. During this period, the anvil cam tracks, which have the anvil assemblies 106 mounted thereon, run parallel to the seal drum 102. The hot wire 110 moves laterally in synchronization with the film 108 and the anvil 134, thereby pinching the film 108 between the hot wire 110 and the anvil 134 for a period of time sufficient to sever the film 108 and seal the resulting severed edges. In a different embodiment, the cutting assemblies 114 are reciprocated radially inwardly and outwardly from the seal drum 102 by a linear actuator, pneumatic or hydraulic cylinder, solenoid, or the like. In yet another embodiment, a pair of counter-rotating tank-tread-shaped belts may carry a plurality of hot wire assemblies and anvil assemblies. In still another embodiment, the film 108 could be advanced intermittently between a hot wire assembly and an anvil assembly that close

together to sever and seal the film 108, but that do not move in the direction the film 108 is being fed.

Claim 23 recites a method of severing and sealing a plurality of layers of film 108 formed of a thermoplastic material (page 5, lines 2-6). One step in the method comprises the step of heating a cutting edge implement to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of the film 108. The temperature is sufficient to melt but not to burn a thermoplastic material (page 7, lines 22-31). The method further includes the step of pinching the plurality of layers of the film 108 between a substrate and the cutting edge implement wherein the implement is heated to the temperature between about 600° F and about 800° F. The cutting edge implement is pressed toward the substrate with the plurality of layers of the film 108 pinched therebetween until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film 108 by melting but not burning the plurality of layers, contacts the substrate, and seals the plurality of layers of the film 108 together (page 6, line 30 – page 7, line 4 and page 11, line 28 – page 12, line 10).

Claim 27 specifies an apparatus 100 for severing and sealing a plurality of layers of film 108 formed of a thermoplastic material (page 5, lines 2-6). The apparatus 100 is comprised of a cutting edge implement, wherein the cutting edge implement is a hot wire 110 with a radius of 0.025 in. (page 8, lines 4-12). The apparatus 100 also includes a controller for regulating the temperature of the cutting edge implement (page 7, lines 16-21 and page 12, lines 7-10). The cutting edge implement is heated to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of film 108, the temperature being sufficient to melt but not to burn a thermoplastic material (page 7, lines 22-31 and page 12, lines 4-10). The apparatus 100 includes an insulating insert 118 for supporting the heated cutting edge implement, a base member 120 for supporting the insulating insert 118, and an anvil 134 (page 8, lines 20-31). The anvil 134 is placed adjacent to the heated cutting edge implement on a side of the heated cutting edge implement opposite from the insulating insert 118 and the base member 120 (page 11, lines 15-22 and Figure 5). The apparatus 100 also includes means for feeding the plurality of layers of the film between the heated cutting edge implement and the anvil 134 and means for moving the heated cutting edge implement and the anvil 134 relative to one another to pinch the plurality of layers of the film 108 there-

between (page 6, lines 3-22; page 10, lines 7-13; and page 11, lines 25-28). Means are also provided for suspending any relative lateral movement between the heated cutting edge implement, the film 108, and the anvil 134, while pressing the heated cutting edge implement toward the anvil 134 with the plurality of layers of the film 108 pinched therebetween (page 9, lines 15-28 and page 11, line 28 – page 12, line 4). Relative lateral movement is suspended until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film 108 by melting but not burning the plurality of layers, contacts the anvil 134, and seals the plurality of layers of the film 108 together (page 7, lines 1-4 and page 12, lines 4-10).

The means for moving the heated cutting edge implement and the anvil and the means for suspending any relative lateral movement between the heated cutting edge implement, the film 108, and the anvil 134, as specified by claim 27, comprise a rotating seal drum 102 and a cam shaped track assembly. The seal drum 102 includes a plurality of cutting assemblies 114, wherein each cutting assembly 114 has a cutting edge implement in the form of a hot wire 110. The cam shaped track assembly includes a pair of opposing anvil cam tracks having a plurality of anvil assemblies 106 mounted thereon at spaced intervals, wherein each of the anvil assemblies 106 includes a pair of spring loaded anvils 134. The film 108 is fed into the apparatus 100 between the rotating seal drum 102 and the counter-rotating anvils 134 by any known means, such as feed rollers. The seal drum 102 and anvil assemblies 106 may be commonly or separately driven by a known motor and gear train or any other known mechanism so that the anvil assemblies 106 move around the cam track assembly 104 at approximately the peripheral speed of the rotating seal drum 102. One of the anvils 134 contacts the film 108 and clamps it firmly against the seal drum 102. The hot wire 110 of the opposing cutting assembly 114 advances through an opening 112 in the seal drum 102 and contacts the film 108, pressing same against the anvil 134. The cutting assemblies 114 are reciprocated radially inwardly and outwardly by way of cam followers 130 moving along cam tracks 132. The cam tracks 132 are designed so that the hot wire 110 of the cutting assembly 114 extends through the opening 112 in the seal drum 102 for approximately one-third of each revolution of same. During this period, the anvil cam tracks, which have the anvil assemblies 106 mounted thereon, run parallel to the seal drum 102. The hot wire 110 moves laterally in synchronization with the film 108 and the anvil 134, thereby pinching the

film 108 between the hot wire 110 and the anvil 134 for a period of time sufficient to sever the film 108 and seal the resulting severed edges. In a different embodiment, the cutting assemblies 114 are reciprocated radially inwardly and outwardly from the seal drum 102 by a linear actuator, pneumatic or hydraulic cylinder, solenoid, or the like. In yet another embodiment, a pair of counter-rotating tank-tread-shaped belts may carry a plurality of hot wire assemblies and anvil assemblies. In still another embodiment, the film 108 could be advanced intermittently between a hot wire assembly and an anvil assembly that close together to sever and seal the film 108, but that do not move in the direction the film 108 is being fed.

Claim 28 is dependent on claim 27 and recites means for laterally moving the heated cutting edge implement along a closed path and means for moving the anvil 134 along a path that is at least in part substantially parallel to a portion of the closed path traveled by the heated cutting edge implement (page 6, line 2-30). The means for moving the heated cutting edge implement and the means for moving the anvil 134 are described above in the discussion of claim 27.

Claim 36 is directed toward an apparatus 100 for severing and sealing a film 108 formed of a thermoplastic material (page 5, lines 2-6). The apparatus 100 is comprised of a cutting edge implement that is a hot wire 110 and a controller for regulating the temperature of the cutting edge implement (page 7, lines 16-21 and page 12, lines 7-10). The cutting edge implement is heated to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of film 108, the temperature being sufficient to melt but not to burn a thermoplastic material (page 7, lines 22-31 and page 12, lines 4-10). The apparatus 100 includes an anvil 134 and feed rollers for feeding the plurality of layers of the film 108 between the heated cutting edge implement and the anvil 134 (page 6, lines 18-22). Additionally, at least one actuator is provided for moving the heated cutting edge implement and the anvil 134 relative to one another to pinch the plurality of layers of film 108 there-between, and for pressing the heated cutting edge implement toward the anvil 134 with the plurality of layers of the film 108 pinched therebetween (page 9, lines 15-28 and page 11, line 25 – page 12, line 4). The cutting edge is pressed toward the anvil 134 until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the

plurality of layers of the film 108 by melting but not burning the plurality of layers, contacts the anvil 134, and seals the resulting severed edges (page 7, lines 1-4 and page 12, lines 4-10).

(6) Grounds of rejection to be reviewed on appeal

a) Claims 1, 2, 8, and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Coleman et al. U.S. Patent No. 5,546,732 (hereinafter "Coleman") in view of Gorlich et al. U.S. Patent No. 6,305,149 (hereinafter "Gorlich").

b) Claims 3, 7, and 24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Coleman in view of Gorlich and Motomura U.S. Patent No. 6,260,336 (hereinafter "Motomura").

c) Claims 4, 11, and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Coleman in view of Gorlich and Noel et al. U.S. Patent No. 5,718,101 (hereinafter "Noel").

d) Claim 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Coleman in view of Gorlich and Dworak et al. U.S. Patent No. 5,094,657 (hereinafter "Dworak").

e) Claims 15-18, 22, 36, and 39 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Coleman in view of Gorlich and Noel.

f) Claims 27, 30, 34, and 35 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wildmoser U.S. Patent No. 4,115,182 (hereinafter "Wildmoser") in view of Gorlich.

g) Claims 28 and 29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wildmoser in view of Gorlich and Motomura.

h) Claims 37 and 38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Coleman in view of Gorlich, Noel, and Dworak.

(7) Argument

Applicants traverse the examiner's rejection of the claims at issue as obvious over one or more of Coleman, Dworak, Gorlich, Motomura, Noel, and Wildmoser.

a) The rejection of claims 1, 2, 8, and 23 under 35 U.S.C. § 103(a) as being unpatentable over Coleman in view of Gorlich.

None of the cited references discloses or suggests, either singly or in combination, a method of severing and sealing a plurality of layers of film with a cutting edge implement heated between about 600°F and about 800°F that melts but does not burn a thermoplastic material, as specified by claims 1, 2, 8, and 23.

In fact, Coleman describes only a method of severing and sealing a plurality of layers of film by way of a heated blade (120) that pinches webs (28, 30, and 34) against an anvil roller (122) (col. 5, lines 13–28). No temperature range is disclosed within which the blade should be heated.

Gorlich discloses the cutting of plastic film (92) with either a cooled blade (col. 7, lines 32-38) or a blade at a temperature "sufficiently high to cause plastic vaporization." (col. 10, lines 7-9). The sealing step is a separate step from the cutting step and is directed to sealing the plastic film (92) to a tray (55), not to another layer of film (col. 7, lines 22-23). Indeed, Gorlich discloses different temperature ranges for the cutting and sealing steps. In one embodiment, a "conventional heat sealing operation" is used (col. 7, lines 18–19) to seal the film (92) to a tray (55) with a sealer (86). After the film (92) is sealed to the tray (55) the film is cut with a cutter (88) (col. 7, lines 22-23). The differentiation in temperature between the sealer (86) and cutter (88) is apparent from the need to supply a coolant to the cutter so the operation of the cutter is not "adversely affected by the ambient heat within the assembly which is greatly augmented by the heat created by the sealing operation" (col. 7, lines 33–39).

In a second embodiment, Gorlich utilizes the aforementioned sealer (86) and an alternate cutting system (288) that comprises a heater (302) extending along the periphery of a blade (290). A temperature range of about 600°F to 900°F, which is dependent on the material to be cut, is to be used by the cutting system (288) to cause plastic vaporization of a single layer of the film (92). The sealer (88) and alternate cutting system (288) utilize different temperature ranges to perform sealing and cutting steps that the present invention can perform in one simultaneous step within one temperature range. In one example, Gorlich teaches that a certain plastic layer could be sufficiently softened to be sealed to other layers at a temperature of approximately 250°F, while the same plastic would have a cutting temperature of about 800°F (Col. 10, lines 7–20).

The examiner stated in an interview summary sheet dated March 3, 2004, that "[t]he heated cutting tool of Gorlich used on multiple layers of material would inherently seal the layers during the process of severing the layers." Also, the examiner contended in the Office Action dated November 4, 2004, on page 3 that "it is deemed inherent that the references cited will seal the thermoplastic material without burning the thermoplastic material in the same manner as the applicant's invention because the same physical elements are met." Applicants disagree with the examiner's characterization of the art and note that it is well understood that "a new use of a known process, machine, manufacture, composition of matter, or material" may be patentable 35 U.S.C. § 100(b). To support an inherency rejection, the examiner must provide factual or technical grounds establishing that the inherent feature necessarily flows from the teaching of the cited references. A probability or a possibility is insufficient to show that the cited reference inherently possesses the inherent feature. *Glaxo, Inc. v. Novopharm, Ltd.*, 52 F.3d 1043 (Fed. Cir. 1995). Gorlich teaches the cutting of a single layer of plastic film by quickly vaporizing the film at temperatures greater than 500°F (col. 8, lines 56-64 and col. 10, lines 7-10). It is emphasized that vaporization is necessary for "both rapid and reproducible cutting without blade fouling" (col. 10, lines 9-10) and for cutting the film cleanly (col. 10, lines 17-18). Furthermore, vaporization makes the "use of force . . . unnecessary to the cutting [of the film] and no backing plate is necessary on the side of the film opposite the blade" (col. 10, lines 18-20). By creating heat sufficient to melt but not burn the plurality of layers of the film, the cutting edge implement of the currently claimed invention uses the combination of heat and pressure to allow for severing and sealing of the plurality of layers of the film without the formation of vaporization residue. Therefore, Gorlich does not inherently teach the claimed invention because Gorlich does not inevitably or invariably result in the presently claimed invention of cutting and sealing a plurality of layers of film with a cutting edge implement at a temperature between about 600°F and about 800°F.

Further, because none of the cited references disclose or suggest that it would be desirable or even possible to provide a method to seal and cut a plurality of layers of film with a cutting edge implement heated between about 600°F and about 800°F that melts but does not burn a thermoplastic material, as specified by the claims at issue, it is evident that the claims are not obvious thereover. The prior art must disclose at least a suggestion of an

incentive for the claimed combination of elements in order for a *prima facie* case of obviousness to be established. See *In re Sernaker*, 217 U.S.P.Q. 1 (Fed. Cir. 1983) and Ex *Parte Clapp*, 227 U.S.P.Q. 972, 973 (Bd. Pat. App. 1985). "Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure." *In re Dow Chemical Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988).

Still further, even if the examiner could establish a *prima facie* case of obviousness utilizing the temperature ranges of Gorlich alone or in combination with any of the art cited above, "a prima facie case of obviousness can be rebutted if the applicant (1) can establish the existence of unexpected properties in the range claimed or (2) can show that the art in any material respect taught away from the claimed invention." *In re Geisler*, 116 F.3d 1465, 1469 (C.A.F.C. 1997).

One skilled in the art will realize that the cited art teaches away from the presently claimed invention. Firstly, Gorlich teaches that the sealing of thermoplastic films should be undertaken at lower temperatures than applicants are claiming and independently of cutting the film. Secondly, Coleman and Gorlich teach that the severing of thermoplastic films with a heated blade should be undertaken at temperatures that cause vaporization of thermoplastic films. The presently claimed invention of melting but not burning at ranges typically used for burning or vaporizing thermoplastics is a significant step away from the teachings of the prior art. Under controlling Federal Circuit precedent, "proceeding contrary to the accepted wisdom of the prior art . . . is strong evidence of nonobviousness." See *W.L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 1552 (Fed. Cir. 1983).

b) <u>The rejection of claims 3, 7, and 24 under 35 U.S.C. § 103(a) as being unpatentable over Coleman in view of Gorlich and Motomura.</u>

Claims 3 and 7 are dependent on claim 1 and claim 24 is dependent on claim 23. As noted above in section 7a, claims 1 and 23 are not taught by Coleman and Gorlich. Motomura does not cure the deficiencies of Coleman and Gorlich because Motomura does not disclose or suggest, either singly or in combination with Coleman and Gorlich, a method of severing and sealing a plurality of layers of film with a cutting edge implement heated between about 600°F and about 800°F that melts but does not burn a thermoplastic material. Accordingly, claims 3, 7, and 24 are not obvious over Coleman, Gorlich, and Motomura.

Coleman and Gorlich are discussed above in section 7a, the detail of which is incorporated herein by reference.

Motomura generally teaches a cutter cleaning apparatus for a filling machine. The disclosure refers to a sealer that produces a tubular packaging material formed by continuously sealing in a longitudinal direction. After the packaging material is filled, the packaging material is sealed laterally at predetermined levels. Subsequently, a cutting knife cuts the packaging material between two seal lines formed at each laterally sealed portion.

c) The rejection of claims 4, 11, and 26 under 35 U.S.C. § 103(a) as being unpatentable over Coleman in view of Gorlich and Noel.

Claim 4 is dependent on claim 1, claim 11 is dependent on claim 8, and claim 26 is dependent on claim 23. As noted above in section 7a, claims 1, 8, and 23 are not taught by Coleman and Gorlich. Noel does not cure the deficiencies of Coleman and Gorlich because Noel does not disclose or suggest, either singly or in combination with Coleman and Gorlich, a method of severing and sealing a plurality of layers of film with a cutting edge implement heated between about 600°F and about 800°F that melts but does not burn a thermoplastic material. Accordingly, claims 4, 11, and 26 are not obvious over Coleman, Gorlich, and Noel.

Coleman and Gorlich are discussed above in section 7a, the detail of which is incorporated herein by reference.

Noel discloses a method and apparatus for packaging products such as food. A securing device (30) heat seals a web to a tray to enclose the contents of the package. An apparatus is also utilized to raise a portion of the web located adjacent to the sealed portion during, immediately before, or immediately after the securing step. A separate severing device (46) then cuts the web at the elevated portion by way of a conventional cutting tool or a heated cutting element (Col. 7, lines 48–55).

d) The rejection of claim 12 under 35 U.S.C. § 103(a) as being unpatentable over Coleman in view of Gorlich and Dworak.

Claim 12 is dependent on claim 8. As noted above in section 7a, claim 8 is not taught by Coleman and Gorlich. Dworak does not cure the deficiencies of Coleman and Gorlich

because Dworak does not disclose or suggest, either singly or in combination with Coleman and Gorlich, a method of severing and sealing a plurality of layers of film with a cutting edge implement heated between about 600°F and about 800°F that melts but does not burn a thermoplastic material. Accordingly, claim 12 is not obvious over Coleman, Gorlich, and Dworak.

Coleman and Gorlich are discussed above in section 7a, the detail of which is incorporated herein by reference.

Dworak is directed toward a method and apparatus for sealing polyethelene at high speeds. A heating element (108) moves radially into a drum slot (106) that is covered by film shields (148) to prevent direct contact between the heating element (108) and plastic film (22). A dual drum chain (78) moves a separate knife block assembly (154) into position to perforate the center of a heat seal with serrated edges. Alternatively, a cut-off knife assembly could be used to eliminate the perforation step. Dworak also teaches that the separate heating element (108) heats the film to a temperature in the range of 250°F to effectively liquefy and seal the film.

e) <u>The rejection of claims 15-18, 22, 36, and 39 under 35 U.S.C. § 103(a) as being unpatentable over Coleman in view of Gorlich and Noel.</u>

None of the cited references discloses or suggests, either singly or in combination, an apparatus for severing and sealing a plurality of layers of film with a hot wire heated between about 600°F and about 800°F that melts but does not burn a thermoplastic material, as specified by claims 15-18, 22, 36, and 39.

Coleman and Gorlich are discussed above in section 7a, the detail of which is incorporated herein by reference.

Noel is discussed above in section 7c, the detail of which is incorporated herein by reference.

The examiner stated in an interview summary sheet dated March 3, 2004, that "[t]he heated cutting tool of Gorlich used on multiple layers of material would inherently seal the layers during the process of severing the layers." Also, the examiner contended in the Office Action dated April 27, 2004, on page 8, that "it is deemed inherent that the references cited will seal the thermoplastic material without burning the thermoplastic material in the same

manner as the applicant's invention because the same physical elements are met." Applicants disagree with the examiner's characterization of the art and note that claims 15-18, 22, 36, and 39, which are directed toward an apparatus, contain structure not found in the cited references. To support an inherency rejection, the examiner must provide factual or technical grounds establishing that the inherent feature necessarily flows from the teaching of the cited references. A probability or a possibility is insufficient to show that the cited reference inherently possesses the inherent feature. *Glaxo, Inc. v. Novopharm, Ltd.*, 52 F.3d 1043 (Fed. Cir. 1995). Gorlich teaches the cutting of a single layer of plastic film by quickly vaporizing the film at temperatures greater than 500°F (col. 8, lines 56-64 and col. 10, lines 7-10). It is emphasized that vaporization is necessary for "both rapid and reproducible cutting without blade fouling" (col. 10, lines 9-10) and for cutting the film cleanly (col. 10, lines 17-18). Furthermore, vaporization makes the "use of force . . . unnecessary to the cutting [of the film] and no backing plate is necessary on the side of the film opposite the blade" (col. 10, lines 18-20). By creating heat sufficient to melt but not burn the plurality of layers of the film, the cutting edge implement of the currently claimed invention uses the combination of heat and pressure to allow for severing and sealing of the plurality of layers of the film without the formation of vaporization residue. Therefore, Gorlich does not inherently teach the claimed invention because Gorlich does not inevitably or invariably result in the presently claimed invention of cutting and sealing a plurality of layers of film with a cutting edge implement at a temperature between about 600°F and about 800°F.

Further, because none of the cited references disclose or suggest that it would be desirable or even possible to provide an apparatus to seal and cut a plurality of layers of film with a hot wire heated between about 600°F and about 800°F that melts but does not burn a thermoplastic material, as specified by the claims at issue, it is evident that the claims are not obvious thereover. The prior art must disclose at least a suggestion of an incentive for the claimed combination of elements in order for a *prima facie* case of obviousness to be established. See *In re Sernaker*, 217 U.S.P.Q. at 1 and Ex *Parte Clapp*, 227 U.S.P.Q. at 973. "Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure." *In re Dow Chemical Co.*, 837 F.2d at 473.

Still further, even if the examiner could establish a *prima facie* case of obviousness utilizing the temperature ranges of Gorlich alone or in combination with any of the art cited

above, "a prima facie case of obviousness can be rebutted if the applicant (1) can establish the existence of unexpected properties in the range claimed or (2) can show that the art in any material respect taught away from the claimed invention." *In re Geisler*, 116 F.3d at 1469.

One skilled in the art will realize that the cited art teaches away from the presently claimed invention. Firstly, Gorlich teaches that the sealing of thermoplastic films should be undertaken at lower temperatures than applicants are claiming and independently of cutting the film. Secondly, Coleman and Gorlich teach that the severing of thermoplastic films should be undertaken at temperatures that cause vaporization of thermoplastic films. The presently claimed invention of melting but not burning at ranges typically used for burning or vaporizing thermoplastics is a significant step away from the teachings of the prior art. Under controlling Federal Circuit precedent, "proceeding contrary to the accepted wisdom of the prior art . . . is strong evidence of nonobviousness." See *W.L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d at 1552.

f) <u>The rejection of claims 27, 30, 34, and 35 under 35 U.S.C. § 103(a) as being unpatentable over Wildmoser in view of Gorlich.</u>

None of the cited references discloses or suggests, either singly or in combination, an apparatus for severing and sealing a plurality of layers of film with a hot wire having a radius of 0.025 in. that is heated between about 600°F and about 800°F and that melts but does not burn a thermoplastic material, as specified by claims 27, 30, 34, and 35.

Wildmoser teaches a sealing apparatus for cutting and sealing thermoplastic sheets under tension. A heated impulse wire (40) operates to cut through thermoplastic sheets under tension that are situated between two silicone rubber sealing members (38). The heater wire (40) also supplies sufficient heat in the adjacent areas on each side of the heater wire to fuse the respective ends of the thermoplastic sheets (18a, 20a) to form a heat seal on both sides of the heater wire. Additionally, Wildmoser only discloses a temperature range of 350°F to 550°F to seal the thermoplastic sheets.

Gorlich is discussed above in section 7a, the detail of which is incorporated herein by reference.

The examiner stated in an interview summary sheet dated March 3, 2004, that "[t]he heated cutting tool of Gorlich used on multiple layers of material would inherently seal the

layers during the process of severing the layers." Also, the examiner contended in the Office Action dated April 27, 2004, on page 8, that "it is deemed inherent that the references cited will seal the thermoplastic material without burning the thermoplastic material in the same manner as the applicant's invention because the same physical elements are met." Applicants disagree with the examiner's characterization of the art and note that claims 27, 30, 34, and 35, which are directed toward an apparatus, contain structure not found in the cited references. To support an inherency rejection, the examiner must provide factual or technical grounds establishing that the inherent feature necessarily flows from the teaching of the cited references. A probability or a possibility is insufficient to show that the cited reference inherently possesses the inherent feature. *Glaxo, Inc. v. Novopharm, Ltd.*, 52 F.3d 1043 (Fed. Cir. 1995). Gorlich teaches the cutting of a single layer of plastic film by quickly vaporizing the film at temperatures greater than 500°F (col. 8, lines 56-64 and col. 10, lines 7-10). It is emphasized that vaporization is necessary for "both rapid and reproducible cutting without blade fouling" (col. 10, lines 9-10) and for cutting the film cleanly (col. 10, lines 17-18). Furthermore, vaporization makes the "use of force . . . unnecessary to the cutting [of the film] and no backing plate is necessary on the side of the film opposite the blade" (col. 10, lines 18-20). By creating heat sufficient to melt but not burn the plurality of layers of the film, the cutting edge implement of the currently claimed invention uses the combination of heat and pressure to allow for severing and sealing of the plurality of layers of the film without the formation of vaporization residue. Therefore, Gorlich does not inherently teach the claimed invention because Gorlich does not inevitably or invariably result in the presently claimed invention of cutting and sealing a plurality of layers of film with a cutting edge implement at a temperature between about 600°F and about 800°F.

Further, because none of the cited references disclose or suggest that it would be desirable or even possible to provide an apparatus to seal and cut a plurality of layers of film with a hot wire having a radius of 0.025 in. that is heated between about 600°F and about 800°F that melts but does not burn a thermoplastic material, as specified by the claims at issue, it is evident that the claims are not obvious thereover. The prior art must disclose at least a suggestion of an incentive for the claimed combination of elements in order for a *prima facie* case of obviousness to be established. See *In re Sernaker*, 217 U.S.P.Q. at 1 and Ex *Parte Clapp*, 227 U.S.P.Q. at 973. "Both the suggestion and the expectation of success

must be founded in the prior art, not in the applicant's disclosure." *In re Dow Chemical Co.*, 837 F.2d at 473.

Still further, even if the examiner could establish a *prima facie* case of obviousness utilizing the temperature ranges of Gorlich alone or in combination with any of the art cited above, "a prima facie case of obviousness can be rebutted if the applicant (1) can establish the existence of unexpected properties in the range claimed or (2) can show that the art in any material respect taught away from the claimed invention." *In re Geisler*, 116 F.3d at 1469.

One skilled in the art will realize that the cited art teaches away from the presently claimed invention. Firstly, Gorlich and Wildmoser teach that the sealing of thermoplastic films should be undertaken at lower temperatures than applicants are claiming. Secondly, Gorlich and Wildmoser teach that the severing of thermoplastic films should be undertaken at temperatures that cause vaporization of thermoplastic films. The presently claimed invention of melting but not burning at ranges typically used for burning or vaporizing thermoplastics is a significant step away from the teachings of the prior art. Under controlling Federal Circuit precedent, "proceeding contrary to the accepted wisdom of the prior art . . . is strong evidence of nonobviousness." See *W.L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d at 1552.

g) <u>The rejection of claims 28 and 29 under 35 U.S.C. § 103(a) as being unpatentable over Wildmoser in view of Gorlich and Motomura.</u>

Claims 28 and 29 are dependent on claim 27. As noted above in section 7f, claim 27 is not taught by Wildmoser and Gorlich. Motomura does not cure the deficiencies of Wildmoser and Gorlich because Motomura does not disclose or suggest, either singly or in combination with Wildmoser and Gorlich, an apparatus for severing and sealing a plurality of layers of film with a hot wire having a radius of 0.025 in. that is heated between about 600°F and about 800°F and that melts but does not burn a thermoplastic material. Accordingly, claims 28 and 29 are not obvious over Wildmoser, Gorlich, and Motomura.

Wildmoser is discussed above in section 7f, the detail of which is incorporated herein by reference.

Gorlich is discussed above in section 7a, the detail of which is incorporated herein by reference.

Motomura is discussed above in section 7b, the detail of which is incorporated herein by reference.

h) The rejection of claims 37 and 38 under 35 U.S.C. § 103(a) as being unpatentable over Coleman in view of Gorlich, Noel, and Dworak.

Claims 37 and 38 are dependent on claim 36. As noted above in section 7e, claim 36 is not taught by Coleman, Gorlich, and Noel. Dworak does not cure the deficiencies of Coleman, Gorlich, and Noel because Dworak does not disclose or suggest, either singly or in combination with Coleman, Gorlich, and Noel, an apparatus for severing and sealing a plurality of layers of film with a hot wire heated between about 600°F and about 800°F that melts but does not burn a thermoplastic material. Accordingly, claims 37 and 38 are not obvious over Coleman, Gorlich, Noel, and Dworak.

Coleman and Gorlich are discussed above in section 7a, the detail of which is incorporated herein by reference.

Noel is discussed above in section 7c, the detail of which is incorporated herein by reference.

Dworak is discussed above in section 7d, the detail of which is incorporated herein by reference.

(8) Summary

None of the cited references disclose or suggest, either singly or in combination, an apparatus or method for severing and sealing a plurality of layers of film with a cutting edge implement heated between about 600°F and about 800°F that melts but does not burn a thermoplastic material.

Withdrawal of the final rejections dated November 4, 2004, and allowance of all claims at issue is respectfully requested.

Respectfully submitted,

McCracken & Frank LLP
200 W. Adams
Suite 2150
Chicago, Illinois 60606
(312) 263-4700

April 28, 2005

By: ______________________
Thomas R. Stiebel
Reg. No. 48,682

Claims Appendix

1. A method of severing and sealing a plurality of layers of film formed of a thermoplastic material, the method comprising the steps of:

heating a cutting edge implement to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of the film, the temperature being sufficient to melt but not to burn a thermoplastic material;

feeding the plurality of layers of the film between the heated cutting edge implement and an opposing surface;

moving the heated cutting edge implement and the opposing surface relative to one another to pinch the plurality of layers of film therebetween; and

thereafter, suspending any relative lateral movement between the heated cutting edge implement, the plurality of layers of the film, and the opposing surface, while relatively biasing the heated cutting edge implement and the opposing surface together with the plurality of layers of film pinched therebetween, until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers, contacts the opposing surface, and seals the plurality of layers of the film together.

2. A method according to claim 1, wherein the moving step comprises the step of advancing the heated cutting edge implement in a direction substantially perpendicular relative to a contact area of the opposing surface.

3. A method according to claim 1, wherein the suspending step comprises synchronously moving the heated cutting edge implement, the film, and the opposing surface in substantially the same lateral direction.

4. A method according to claim 1, wherein the heated cutting edge implement is a hot wire, and further comprising the step of, prior to the moving step, supporting the hot wire for substantially its entire effective cutting length.

7. A method according to claim 1, wherein the suspending step comprises suspending relative lateral movement between the heated cutting edge implement, the film, and the opposing surface for approximately one second.

8. A method of severing and sealing a plurality of layers of film, the method comprising the steps of:

heating a cutting edge implement to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of the film, the temperature being sufficient to melt but not to burn a film;

feeding the plurality of layers of the film between the heated cutting edge implement and an opposing surface;

moving the heated cutting edge implement and the opposing surface relative to one another to pinch the plurality of layers of the film therebetween; and

relatively biasing the heated cutting edge implement and the opposing surface together with the plurality of layers of film pinched therebetween, until the cutting edge

implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers and seals the resulting severed edges.

11. A method according to claim 8, wherein the heated cutting edge implement is a hot wire, and further comprising the step of supporting the hot wire for substantially its entire effective cutting length.

12. A method according to claim 8, wherein the moving step comprises pinching the film between the heated cutting edge implement and the other surface for approximately one second.

15. An apparatus for severing and sealing a plurality of layers of film formed of a thermoplastic material, the apparatus comprising:

a cutting edge implement, wherein the cutting edge implement is a hot wire;

a controller for regulating the temperature of the cutting edge implement, wherein the cutting edge implement is heated to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of film, the temperature being sufficient to melt but not to burn a thermoplastic material;

an anvil;

means for feeding the plurality of layers of the film between the heated cutting edge implement and the anvil;

means for moving the heated cutting edge implement and the anvil relative to one another to pinch the plurality of layers of film therebetween; and

means for suspending any relative lateral movement between the heated cutting edge implement, the film, and the anvil, while pressing the heated cutting edge implement toward the anvil with the film pinched therebetween, until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers, contacts the anvil, and seals the plurality of layers of the film together.

16. An apparatus according to claim 15, further comprising:

means for laterally moving the heated cutting edge implement along a closed path; and

means for moving the anvil along a path that is at least in part substantially parallel to a portion of the closed path traveled by the heated cutting edge implement.

17. An apparatus according to claim 16, wherein the heated cutting edge implement, the film, and the anvil all synchronously move in substantially the same lateral direction while the plurality of layers of the film is sealed.

18. An apparatus according to claim 15, wherein the hot wire is supported for substantially its entire effective cutting length by an insulating member.

22. An apparatus according to claim 15, wherein the suspending means suspends any relative lateral movement between the heated cutting edge implement, the film, and the anvil for approximately one second.

23. A method of severing and sealing a plurality of layers of film formed of a thermoplastic material, the method comprising the steps of:

heating a cutting edge implement to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of the film, the temperature being sufficient to melt but not to burn a thermoplastic material;

pinching the plurality of layers of the film between a substrate and the cutting edge implement that is heated to the temperature between about 600° F and about 800° F; and

pressing the cutting edge implement toward the substrate with the plurality of layers of the film pinched therebetween, until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers, contacts the substrate, and seals the plurality of layers of the film together.

24. A method according to claim 23, further comprising the step of feeding the plurality of layers of film in a lateral direction, and synchronously moving the substrate and the heated cutting edge implement in the lateral direction during the pinching and pressing steps.

26. A method according to claim 23, wherein the heated cutting edge implement is a hot wire, and further comprising the step of, prior to the pinching and pressing steps, supporting the hot wire for substantially its entire effective cutting length.

27. An apparatus for severing and sealing a plurality of layers of film formed of a thermoplastic material, the apparatus comprising:

a cutting edge implement, wherein the cutting edge implement is a hot wire with a radius of 0.025 in.;

a controller for regulating the temperature of the cutting edge implement, wherein the cutting edge implement is heated to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of film, the temperature being sufficient to melt but not to burn a thermoplastic material;

an insulating insert for supporting the heated cutting edge implement;

a base member for supporting the insulating insert;

an anvil for placement adjacent to the heated cutting edge implement on a side of the heated cutting edge implement opposite from the insulating insert and the base member;

means for feeding the plurality of layers of the film between the heated cutting edge implement and the anvil;

means for moving the heated cutting edge implement and the anvil relative to one another to pinch the plurality of layers of the film therebetween; and

means for suspending any relative lateral movement between the heated cutting edge implement, the film, and the anvil, while pressing the heated cutting edge implement toward the anvil with the plurality of layers of the film pinched therebetween, until the cutting

edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers, contacts the anvil, and seals the plurality of layers of the film together.

28. An apparatus according to claim 27, further comprising:

means for laterally moving the heated cutting edge implement along a closed path; and

means for moving the anvil along a path that is at least in part substantially parallel to a portion of the closed path traveled by the heated cutting edge implement.

29. An apparatus according to claim 28, wherein the heated cutting edge implement, the film, and the anvil all synchronously move in substantially the same lateral direction while the film is sealed.

30. An apparatus according to claim 27, wherein the hot wire is supported for substantially its entire effective cutting length by the insulating insert.

34. An apparatus according to claim 27, wherein the suspending means suspends any relative lateral movement between the heated cutting edge implement, the film, and the anvil for approximately one second.

35. An apparatus according to claim 27, wherein the insulating insert is made of either mica or ceramic glass.

36. An apparatus for severing and sealing a plurality of layers of film formed of a thermoplastic material, the apparatus comprising:

a cutting edge implement, wherein the cutting edge implement is a hot wire;

a controller for regulating the temperature of the cutting edge implement, wherein the cutting edge implement is heated to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of film, the temperature being sufficient to melt but not to burn a thermoplastic material;

an anvil;

feed rollers for feeding the plurality of layers of the film between the heated cutting edge implement and the anvil;

at least one actuator for moving the heated cutting edge implement and the anvil relative to one another to pinch the plurality of layers of film therebetween, and for pressing the heated cutting edge implement toward the anvil with the plurality of layers of the film pinched therebetween, until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers, contacts the anvil, and seals the resulting severed edges.

37. An apparatus according to claim 36, further comprising:

a first cam apparatus for laterally moving the heated cutting edge implement along a closed path; and

a second cam apparatus for moving the anvil along a path that is at least in part substantially parallel to a portion of the closed path traveled by the heated cutting edge implement.

38. An apparatus according to claim 37, wherein the heated cutting edge implement, the film, and the anvil all synchronously move in substantially the same lateral direction while the plurality of layers of the film is sealed.

39. An apparatus according to claim 36, wherein the hot wire is supported for substantially its entire effective cutting length by an insulating member.